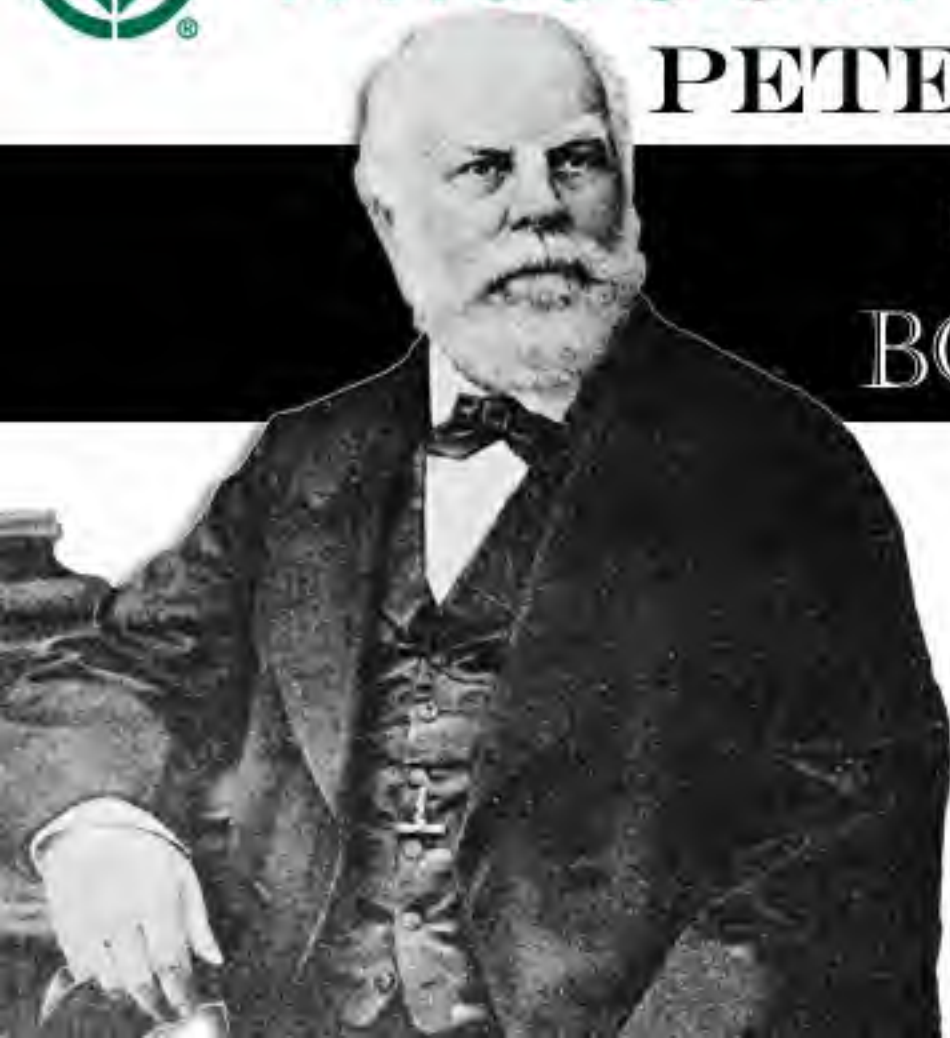


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BOTANICAL NOTEBOOKS

Pagination Note:

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P. balsamum

June 1st 1872

tree south of Green house, H B. Merrill over May 31 1872
SW



8/21 arranged



leaf on main axis

leaf on stouter lateral branch (often more acute)

leaf on last branchlets



X 10



larger, obtuse

leaves only

last branchlets
sterile

sect near tip

middle

above base



stomata on
both sides



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cm

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DRUGGISTS

South-west
Fifth and Market
Streets

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Abies balsamea

Oct 2' 18

Harbot Museum 1872
central band of stoma

H.B. Murrin
1865
is the same



6-8 lines of stom.
in each band

no hypodermis at all in
flatter leaves, in thicker ones
a few cells at keel, in others also a few on edges

covered with stomata

H.B. Cambridge
2/6 1873
is the same



only leaves less
long pointed

about 6 lines of stom.
in each band

no hypodermis above, well developed at edges
some at keel.

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HALL AND STREET



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Abies balsamea

19 July 1872

Abies balsamea

Oct 2nd 1875

lower branches, H. Gillman 1873

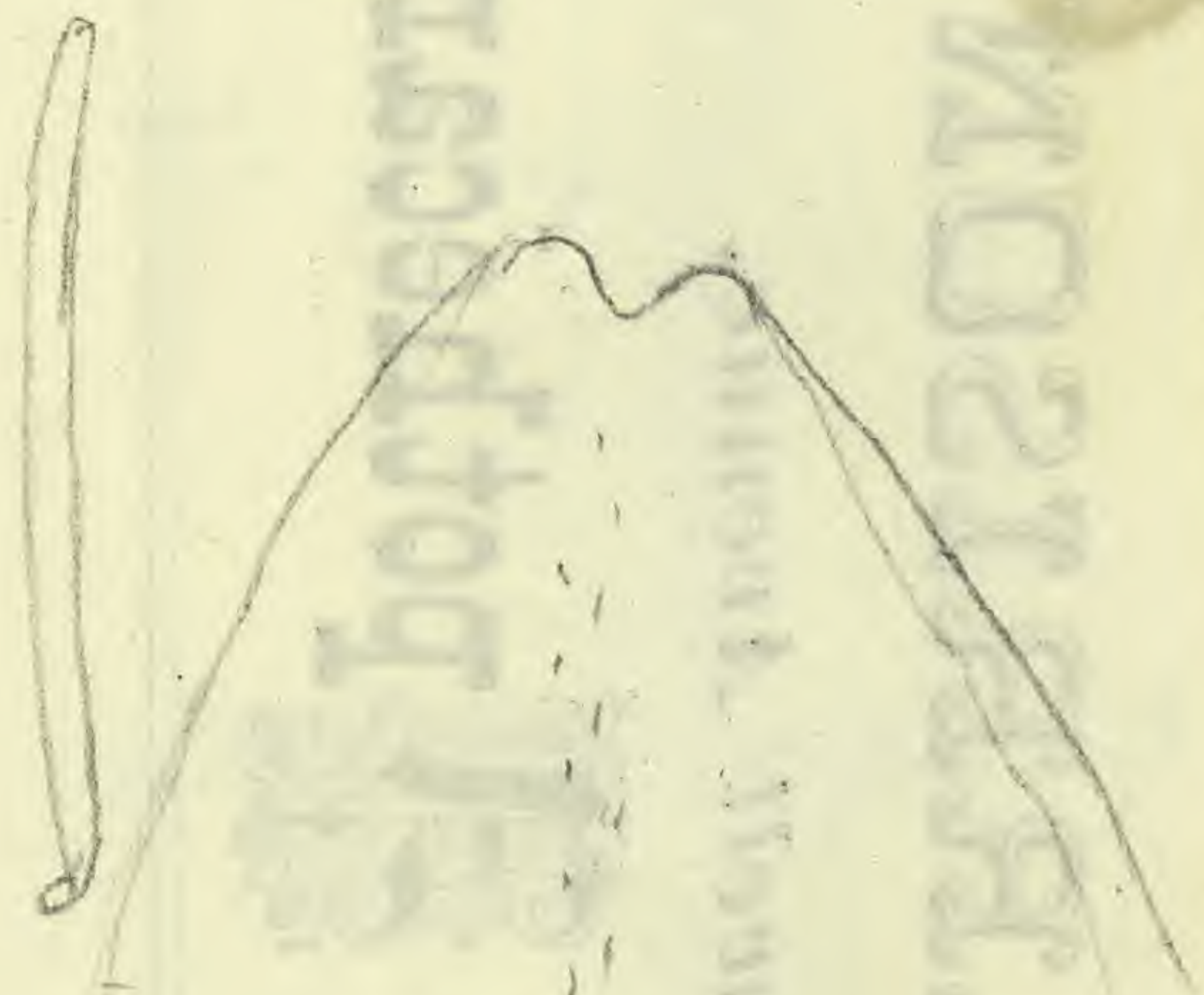
& H. Gillman 1/7 1872

line of few stomata in upper
part of groove



no hypoderm cells
at all!

about 7 lines of stomata
in band



Gillman 1872 has the ducts also toward the margin
and near the lower side of leaf, but separated
from the cortical layer by parenchyma, as in this



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branches -
19
Ruggist & Pounder
Sect.

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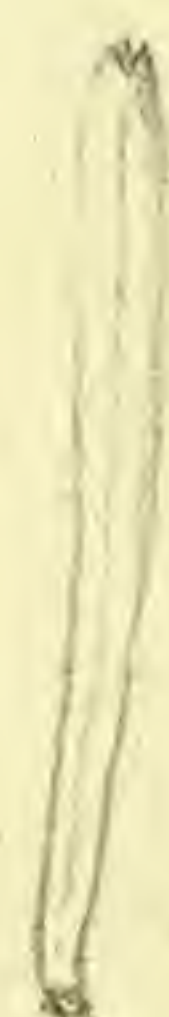
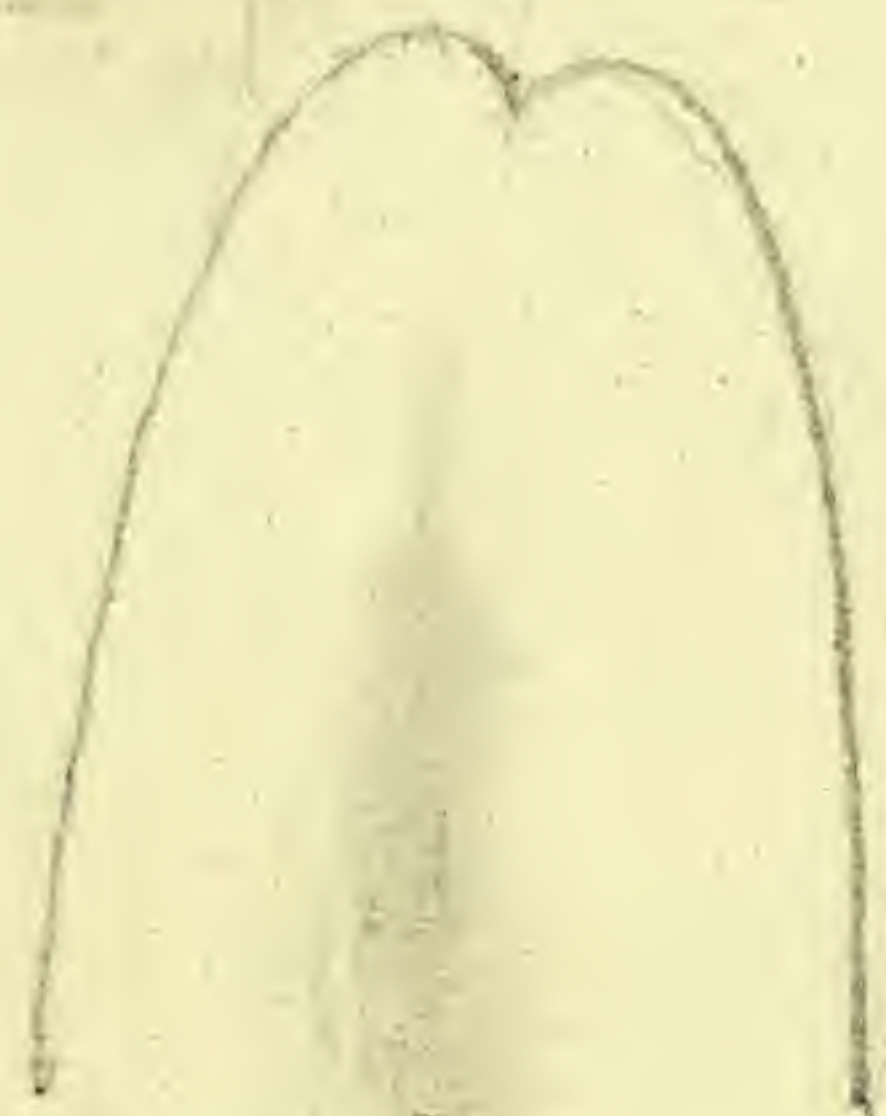
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Abies balsamea

19 July 1872

Michigan, H. Gillman

lower branches -



X 10

tip of leaf



section near



in middle



above base

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A. balsamea

Oct 1 1875

base of Mount Washington

G. Engel - Sept 1856

young tree ?

x 30

no stomata

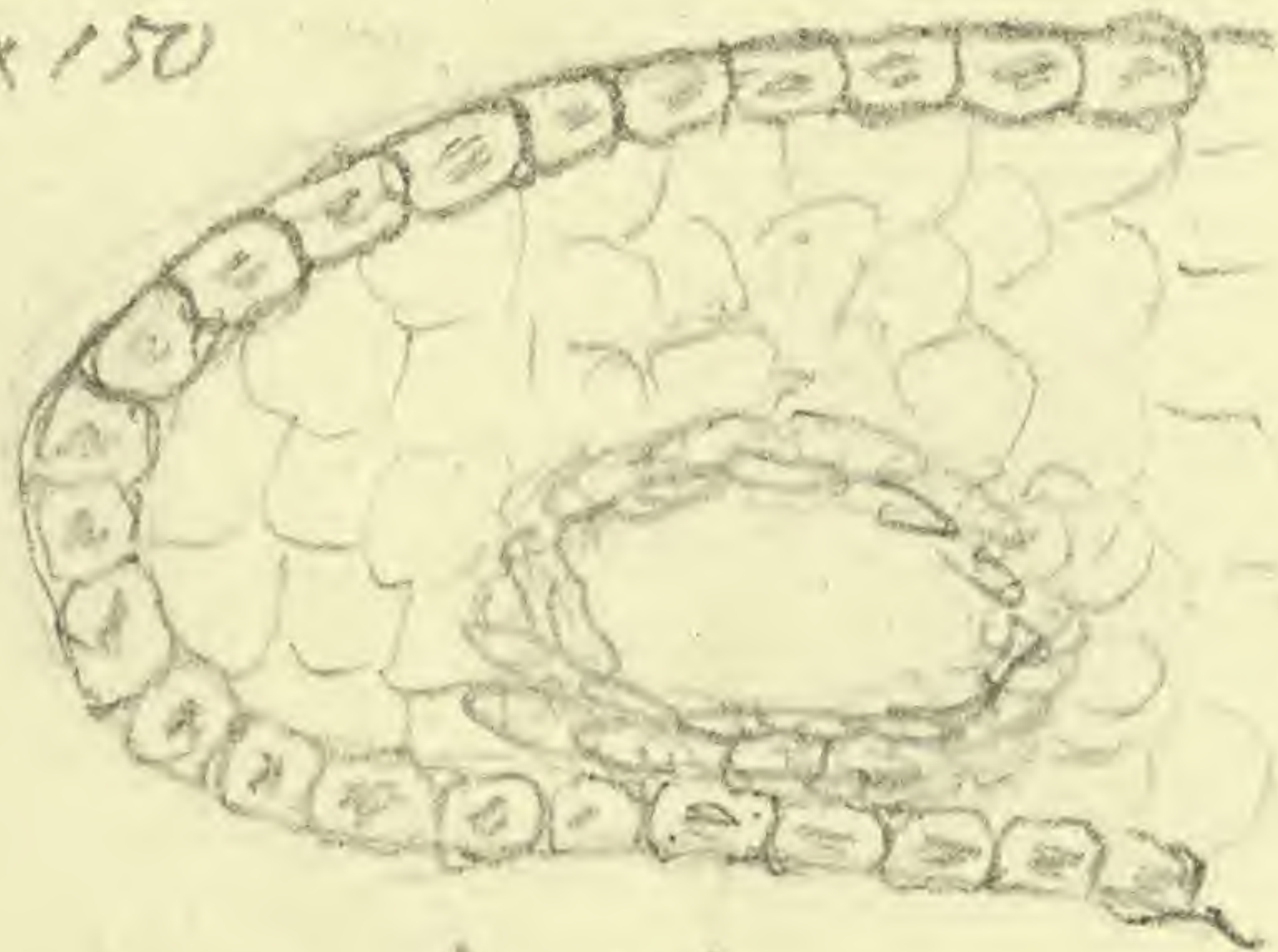


2 bands of stomata

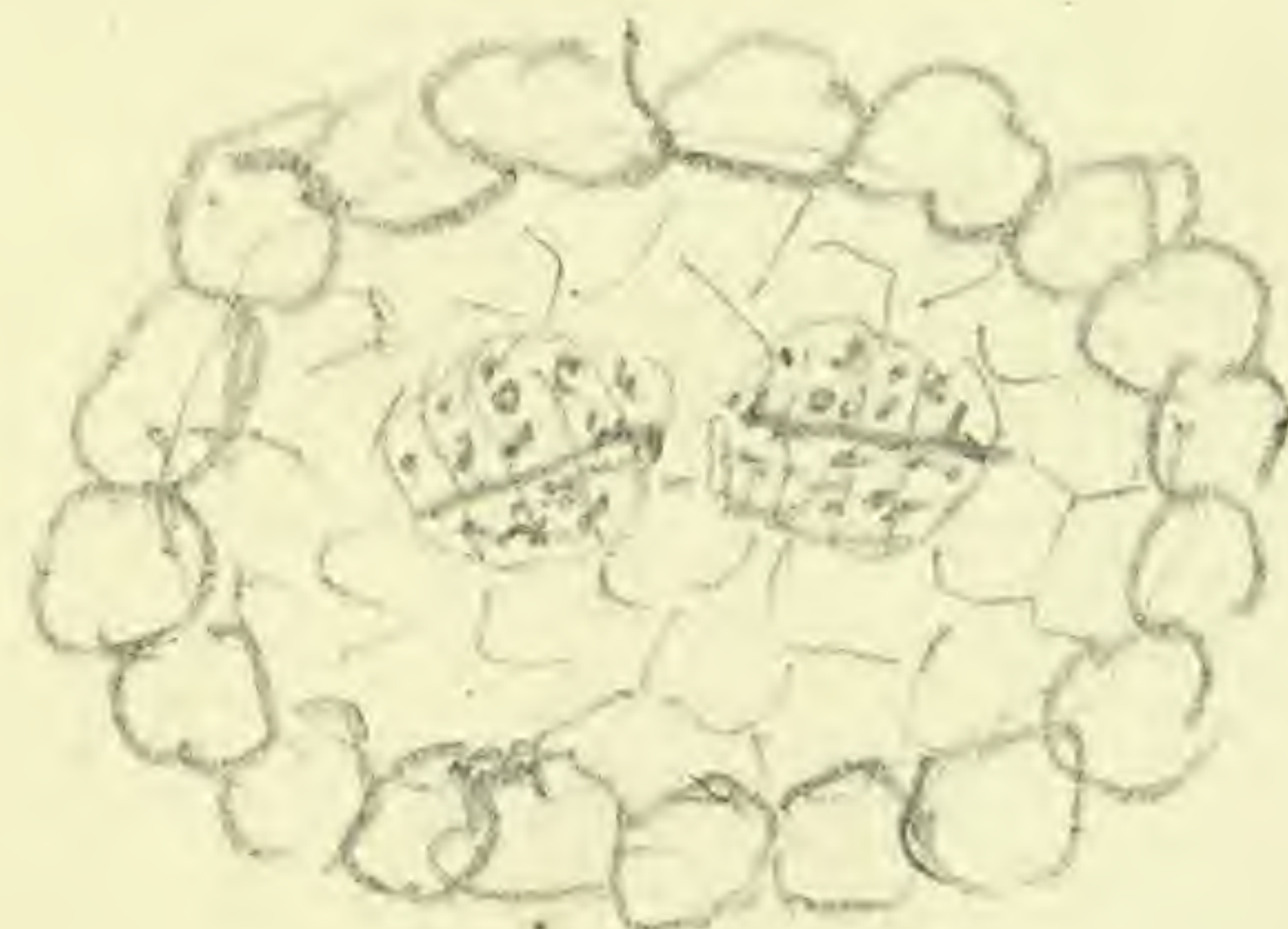
4-6 lines
of stomata in each band



x 150



Jan 25 1876



x 150

no hypoderm at all



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A. balsamea

Oct 1 1875

dwarfed, near top of Mount Washington

, G. Engelm. Sept 1856

x 30

crowded with stomata



two white bands
of stomata, each with
7-8 lines.

no hypoderm above, a few cells only
on carina and on the leaf-edges.



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Abies balsamea

Oct 2nd 1875

Hoopes, West Chester, 1872

fructiferous branch

x 30

surface covered with stomata



4-7 lines of stomata
in each band

Flat leaves have no hypoderm at all
thick leaves, like the above, have none
on upper surface, but on keel and
edges it is strongly developed, all
around the sides, to under the ducts.



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A. balsamea

Octob 2 1875

Norwich, H. Gillman 1873

x 30

few stomata at tip
or none



6-7 lines in each band bands of stomata

this years
leaf
young shoot

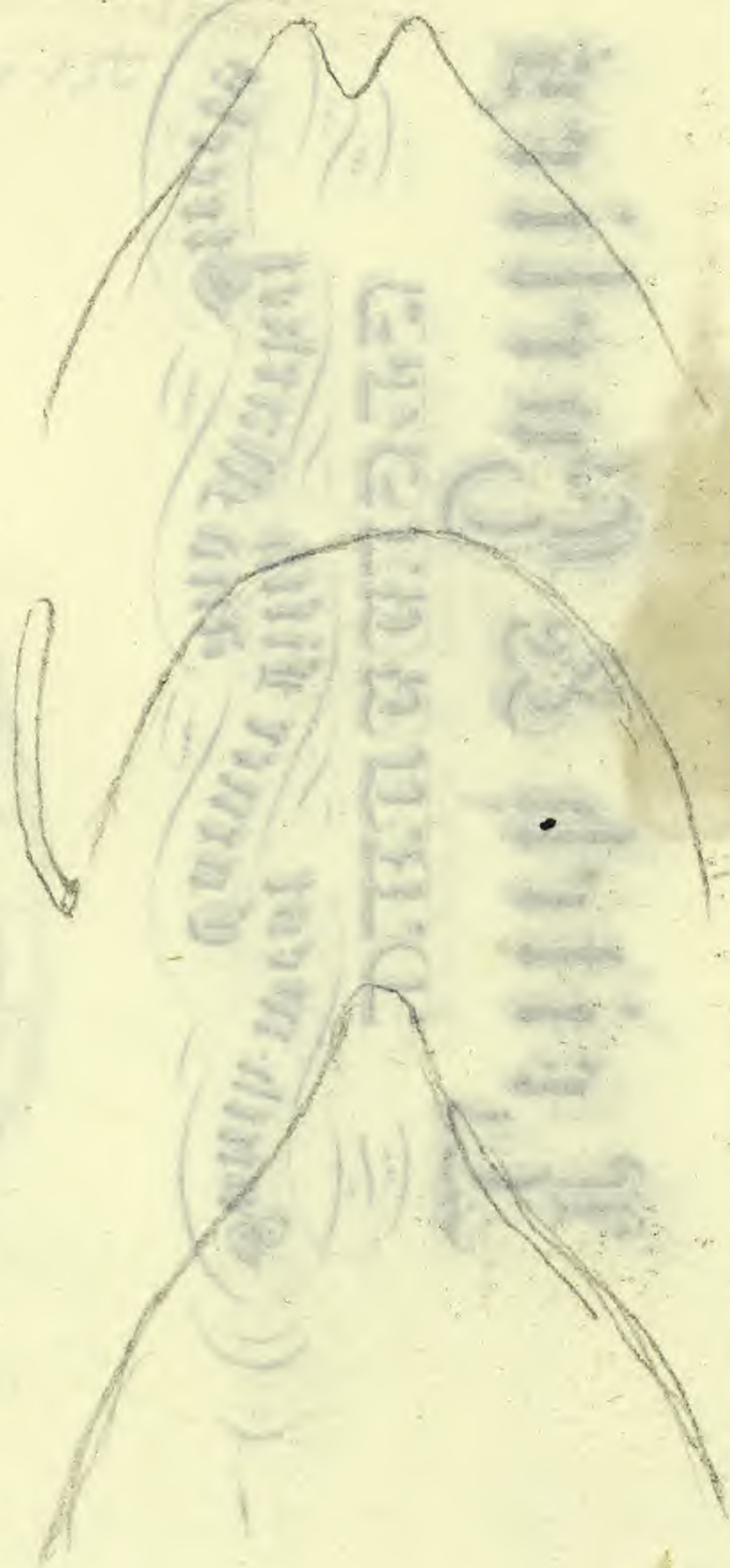
covered with stomata



only 2-4 lines in
each band

Manfield's Vt
in Hb Gray
is very much
like these

covered with stomata



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H. Gillman 1871

x 150



THE GILLMAN
South-west Fifth Market
Corner and Street

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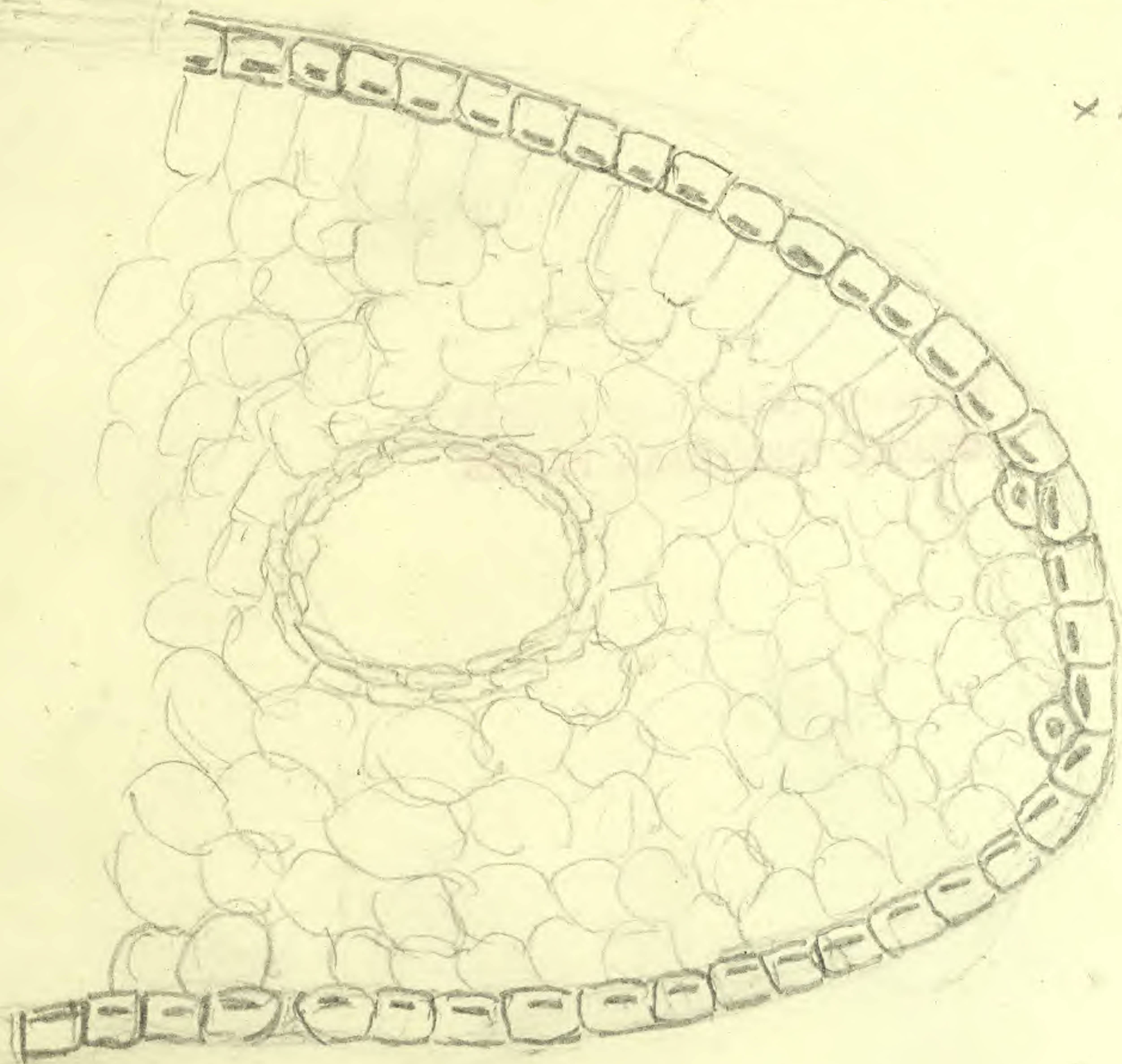


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A. Balsamea

Jan 25 1876

Michigan, H. Gillman 1873



x 150

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1873-1874

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Abies balsamea
Manitou Island, Lake Michigan

Oct 1 1875

G. Engelmann Aug 1860

stomata few, towards tip



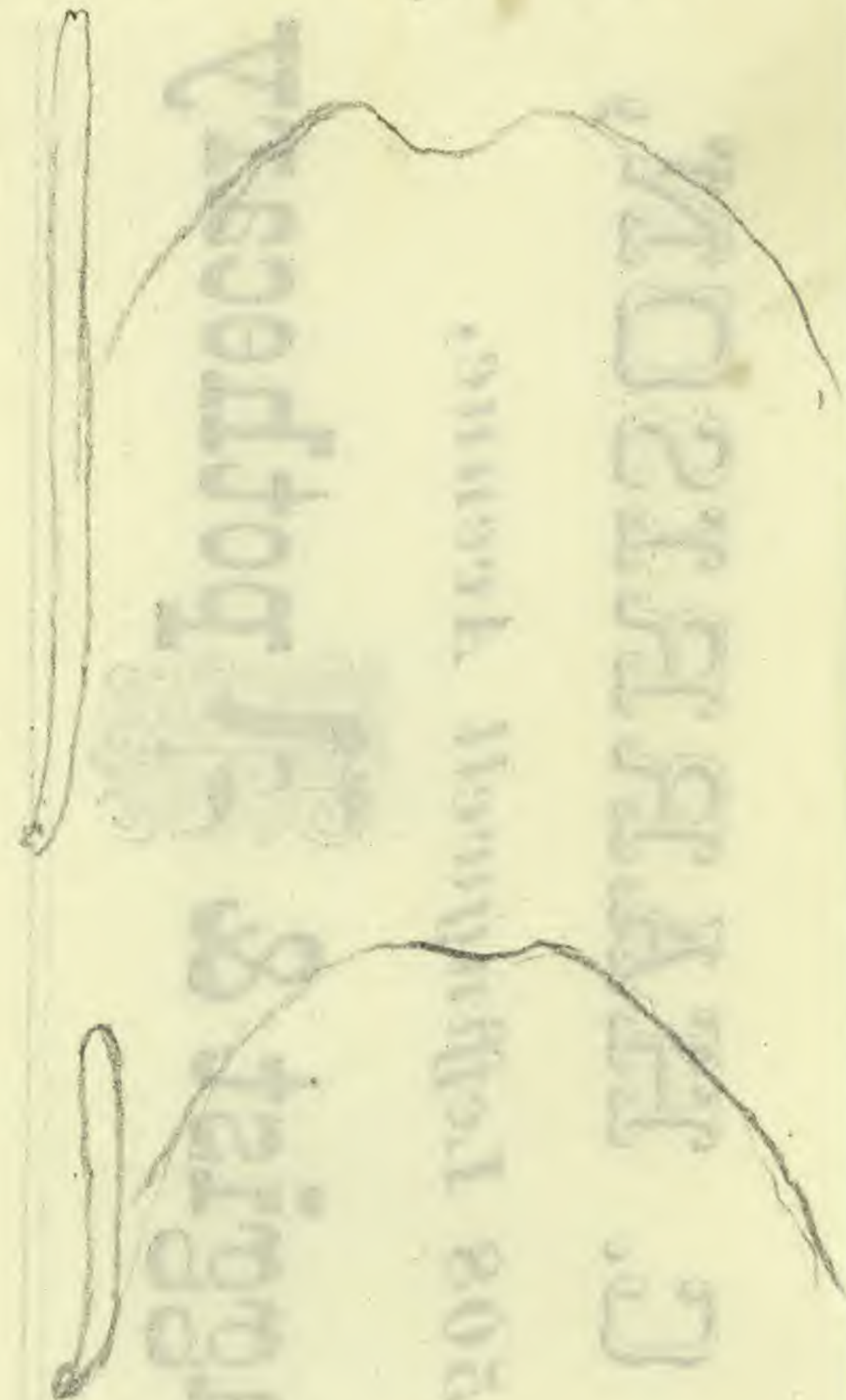
2 bands of stomata
each of 6 lines

middle band of stomata
narrow



2 bands of stomata

scarcely a few hypoderm cells at carina,
none above nor even on edges of leaf



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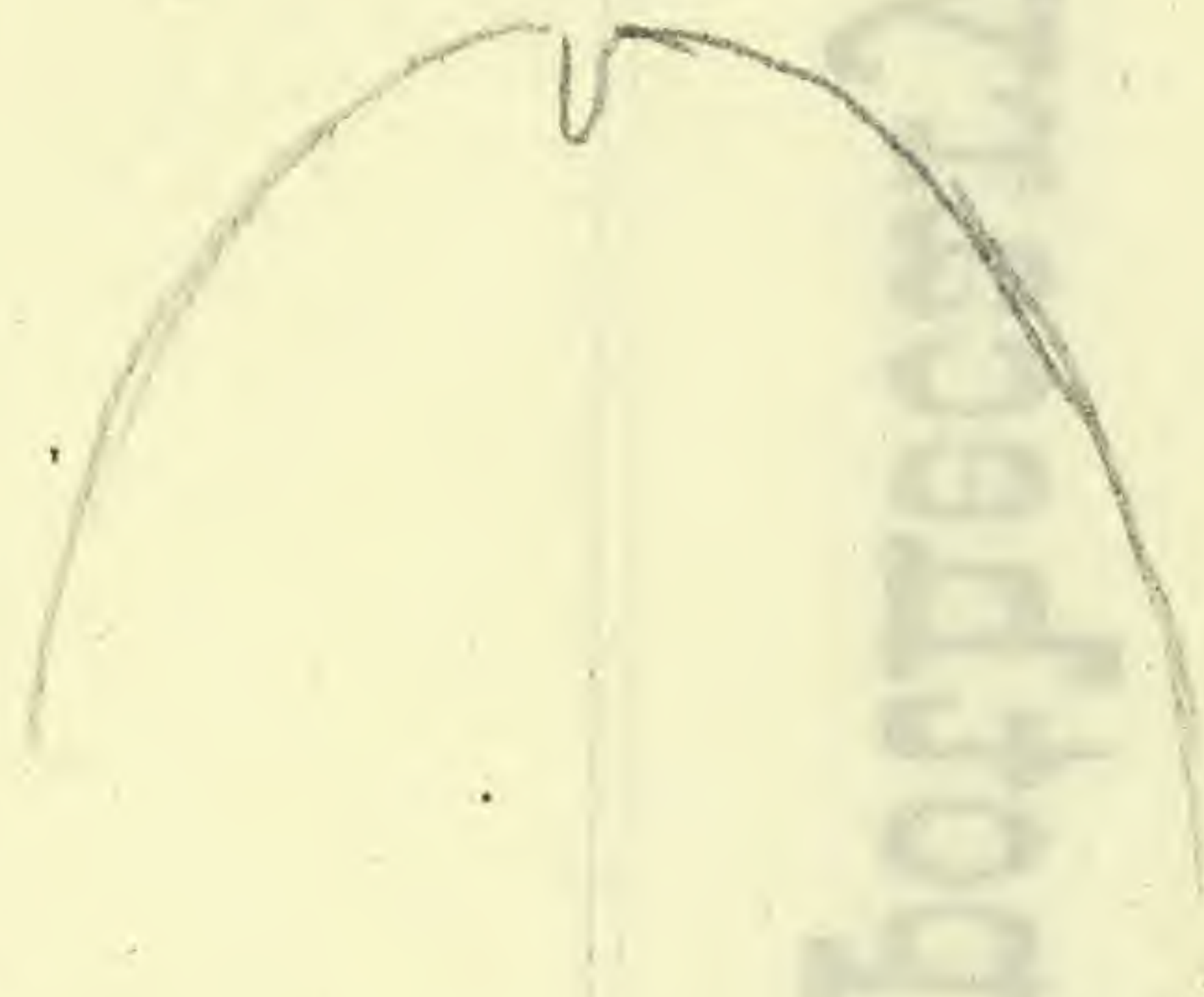
" *Abies Fraseri* "

Oct 2 1875

Hort Bot Berlin 1869

x30

very few stomata



x150



4-6 lines of stomata
in each band

row of few stomata



Stomata not close
to cortical stomata!
some parenchyma cells separating them

very few false butt cells
on edges and lower corina
none as hypodermis layer



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Feb

Abies subalpina
var *gilliesii*

~~lignea~~



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Helix convolvulus divia
Utah A. L. Siler mss

June 12 1876

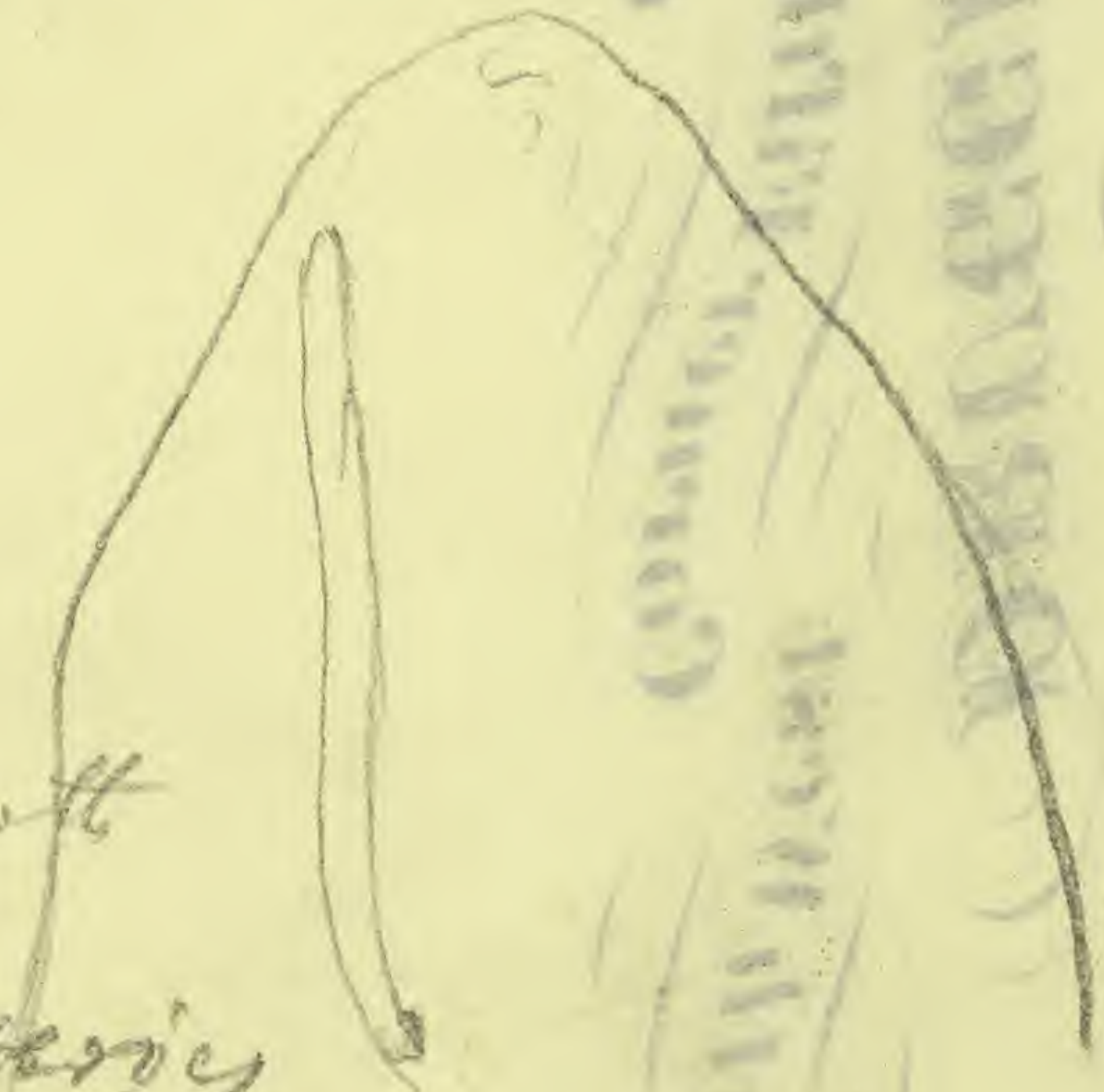
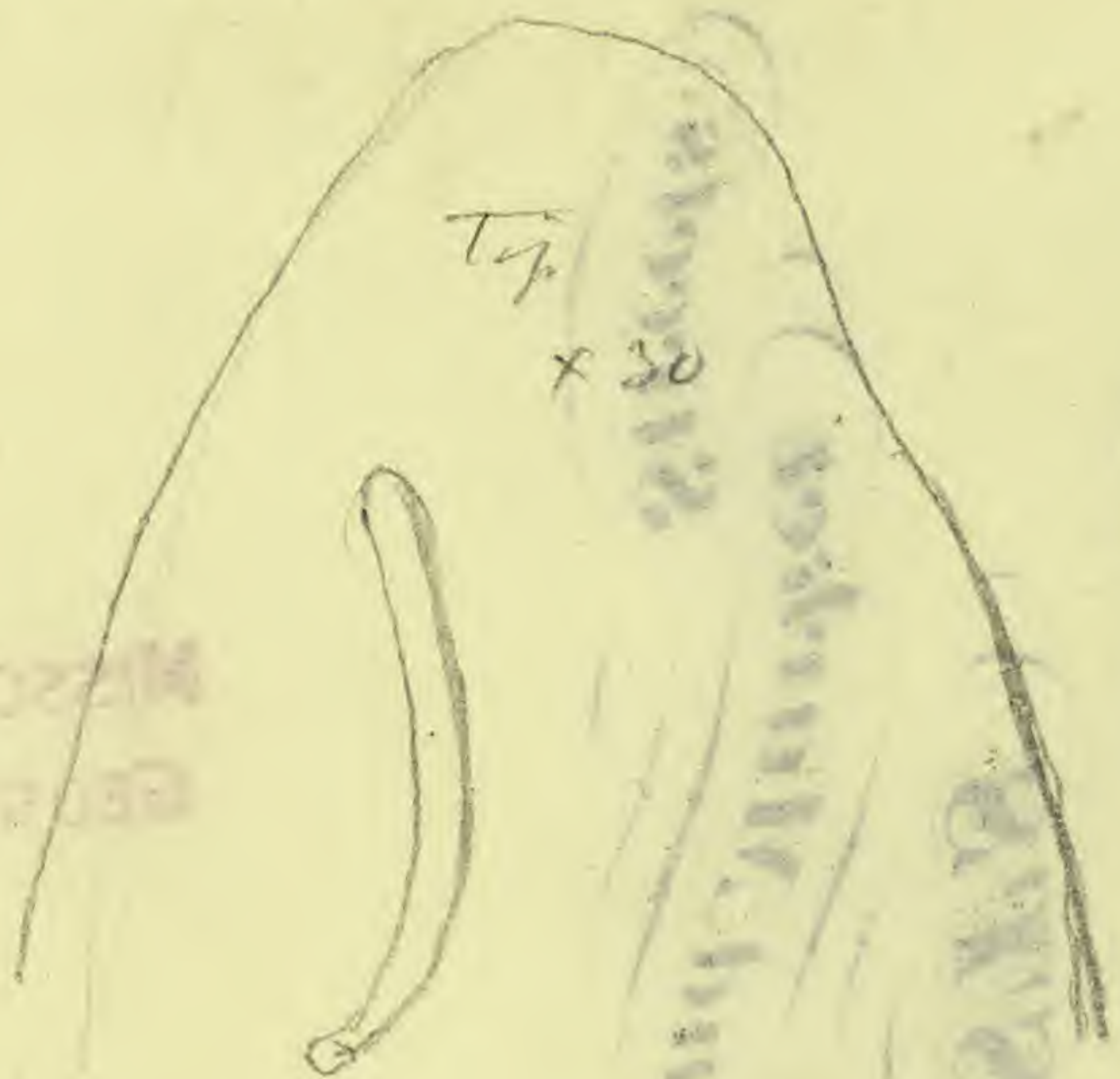
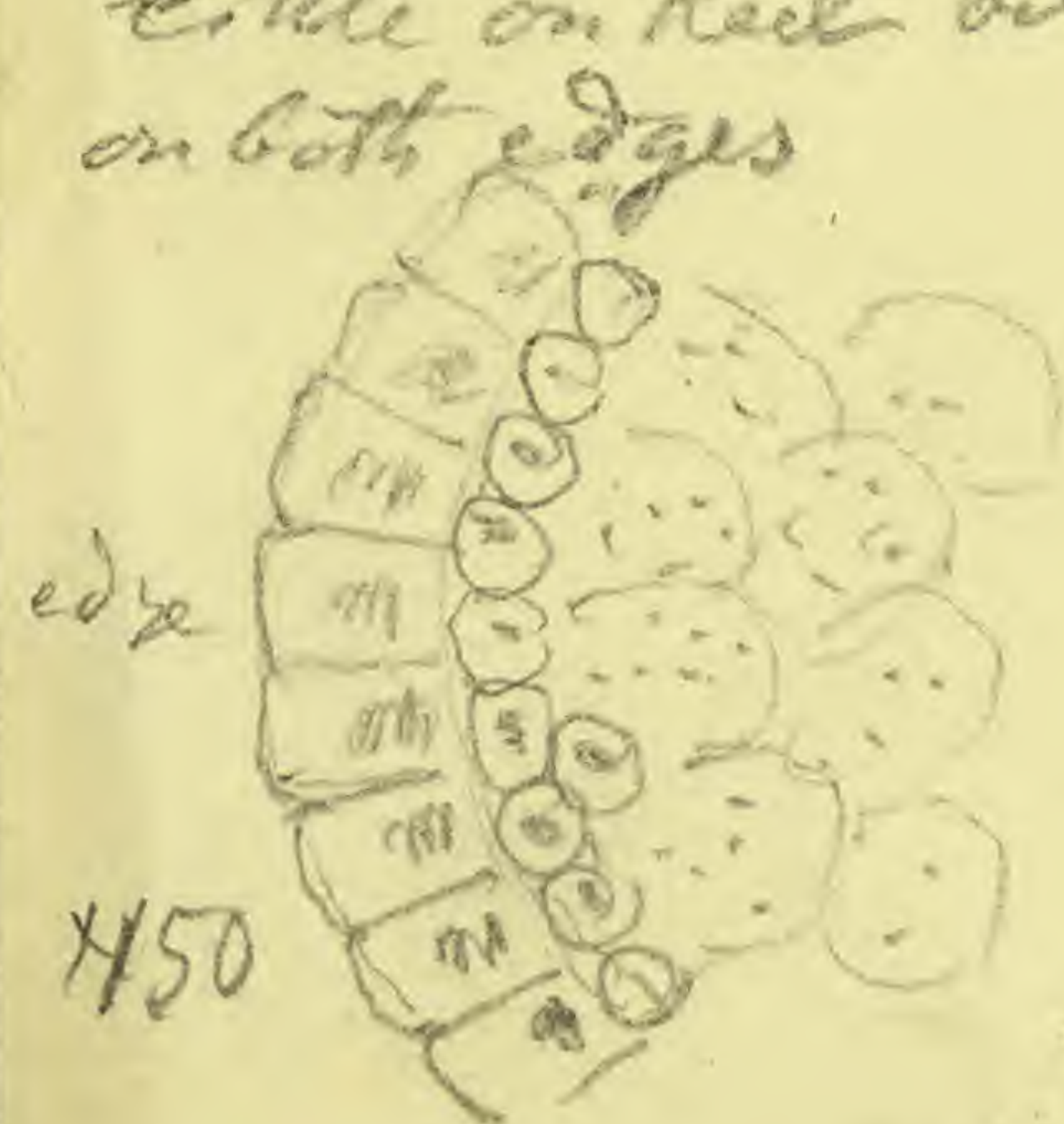
x 30

10-12 series of stomata above



no hypoderm on
upper side - and very
little on keel below; more
on both edges

5-6 series
of stomata
each band



stomata on both
sides
10-12 series
in all



Keel

hypoderm cells
small; not much
over half diameter
of epiderm cells



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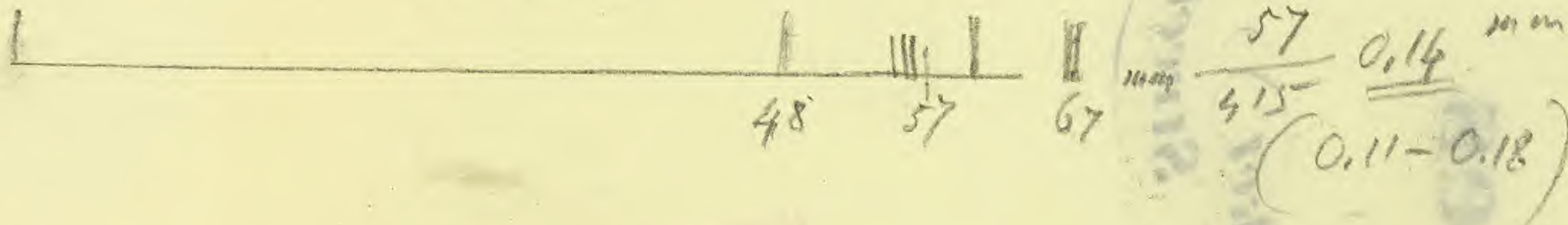
Abies concolor Devia
 Wsh. Silen
 Pollen

Jan 12 1876

x4



♂ anther not open yet
 triangular tip of anther
 dark purple



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"A. amabilis"

Oct 20 x 21

1877

Nashberry 1835 Sept. Cascades

ex Hb. Arnold. Dep.

Do cone and leaves belong together?

14-16 series of stom.

26 x 30



36 mm long

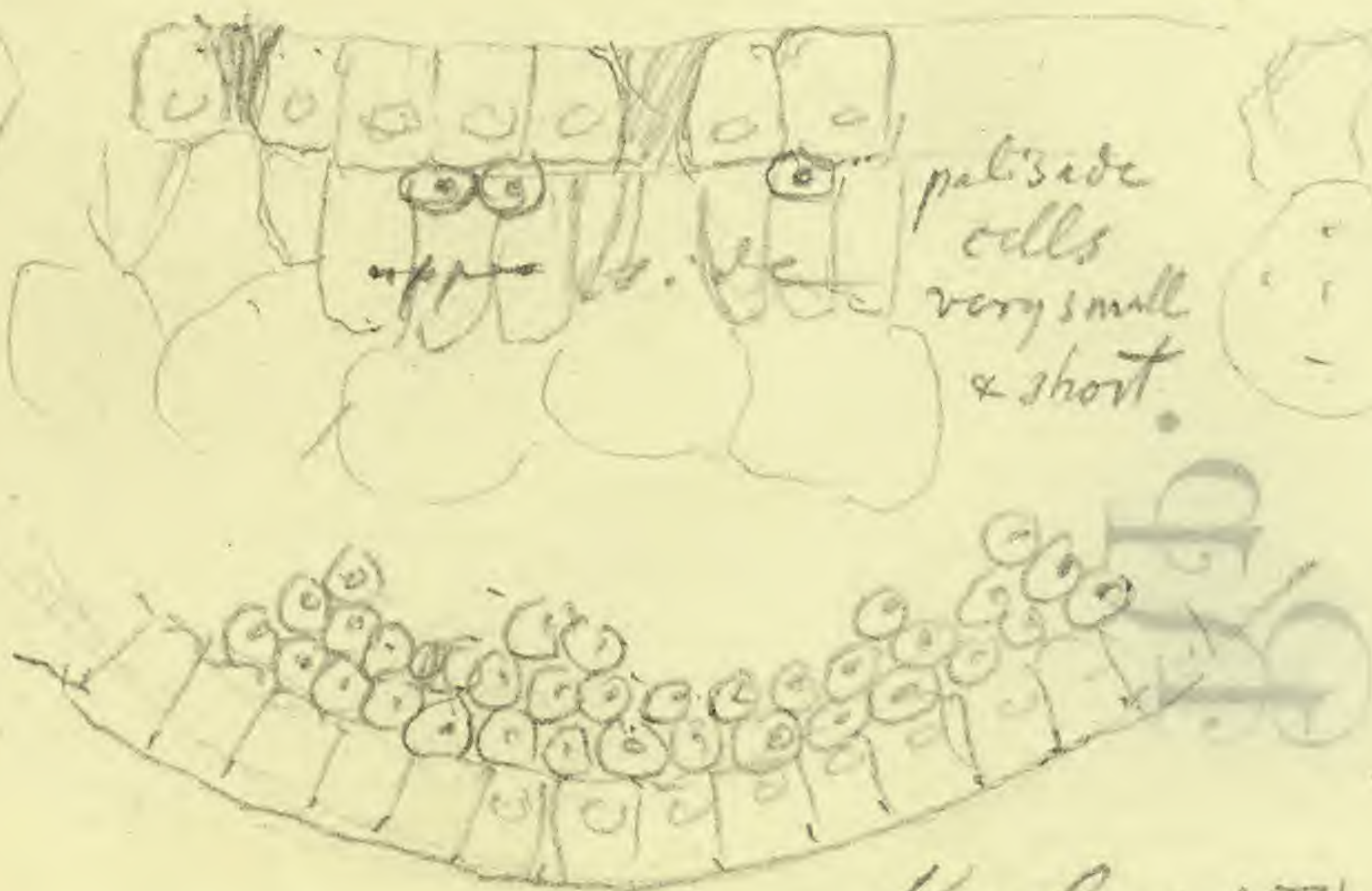
1 1/2 inches

Leaf said to come from fertile branches

yes in
Tuber

hypoderm half as large
as epiderm cells

edge of leaf
x 150



Keel x 150



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Deutsche Apotheke.

—
GEO. WIE,

Apotheker

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Between Mallinckrodt and Salisbury, ST. LOUIS, MO.

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For

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0

1

2

3

4

5

6

7

8

9

10

cm

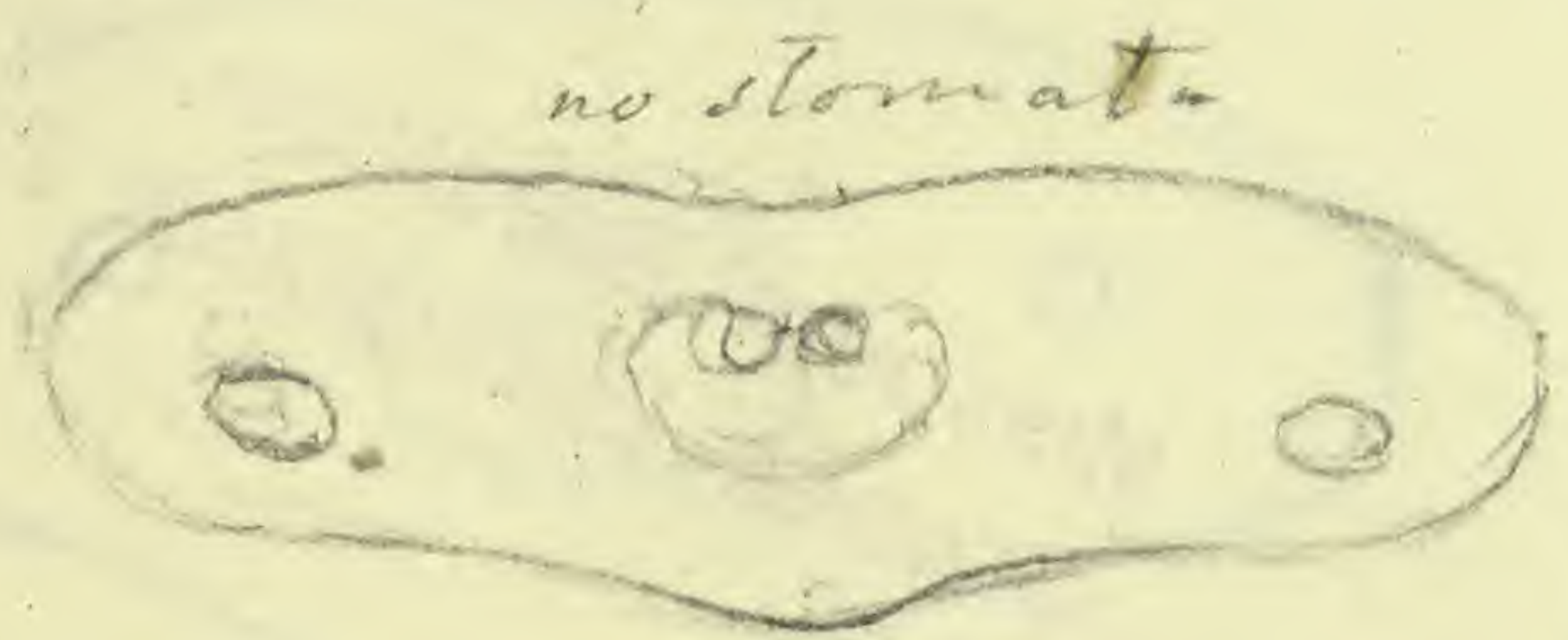
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no stomata

hypodermis
on edges a row
no



Oct 26 1875



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united



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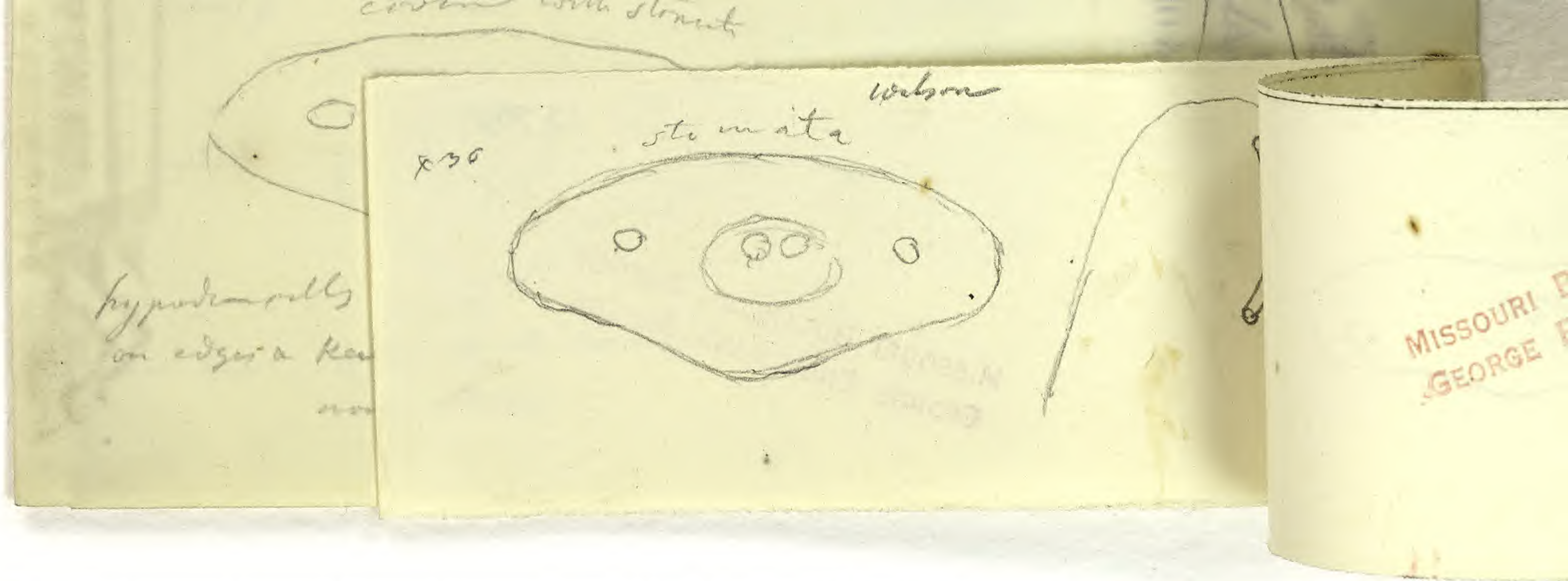
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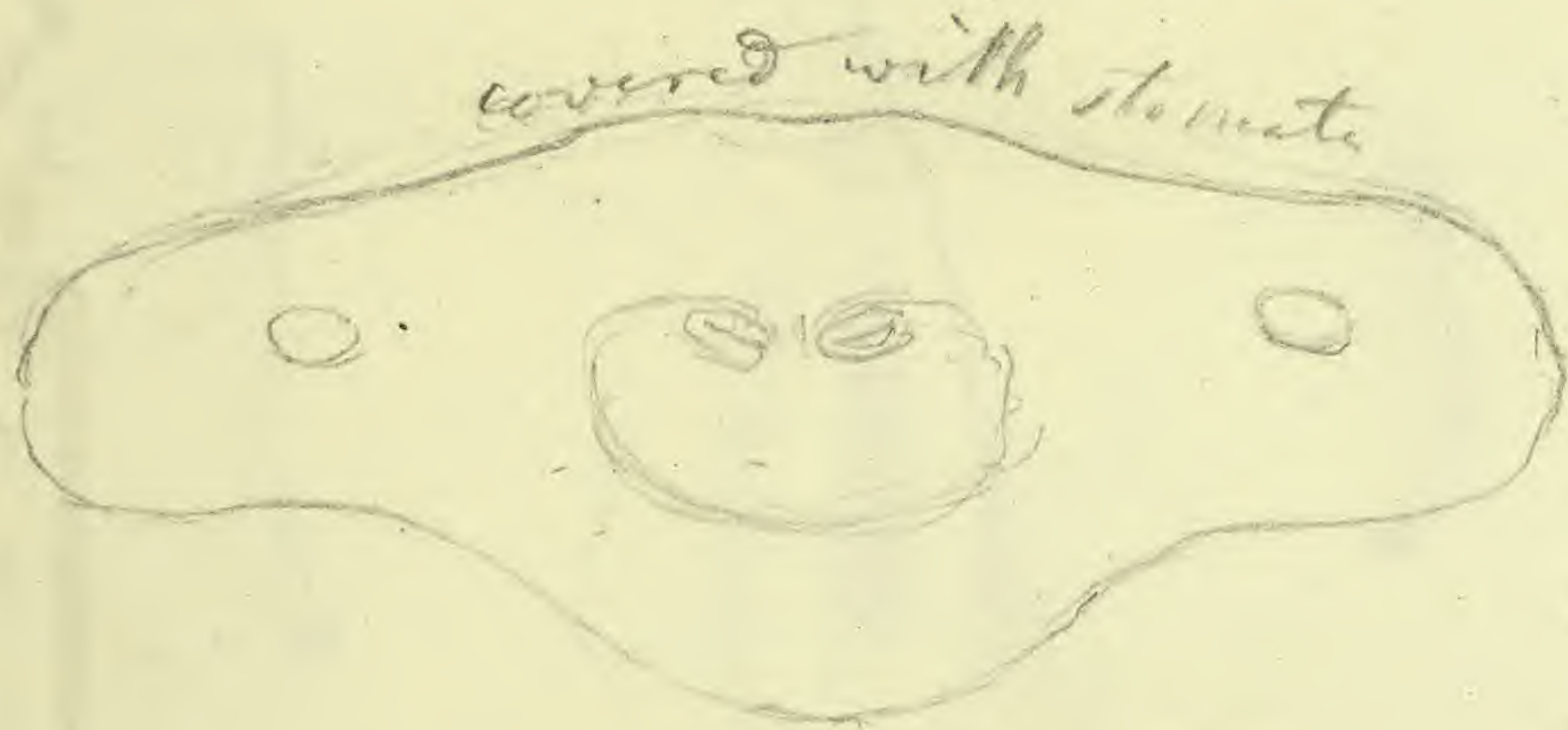
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Abies "amabilis"

Oct 13 1895

Wasatch Mtns

Utah



curved
leaves
of

glaucous obtuse
exactly like those
of *Coronilla*



hypodermis small
on edges a keel, quite narrow
near above



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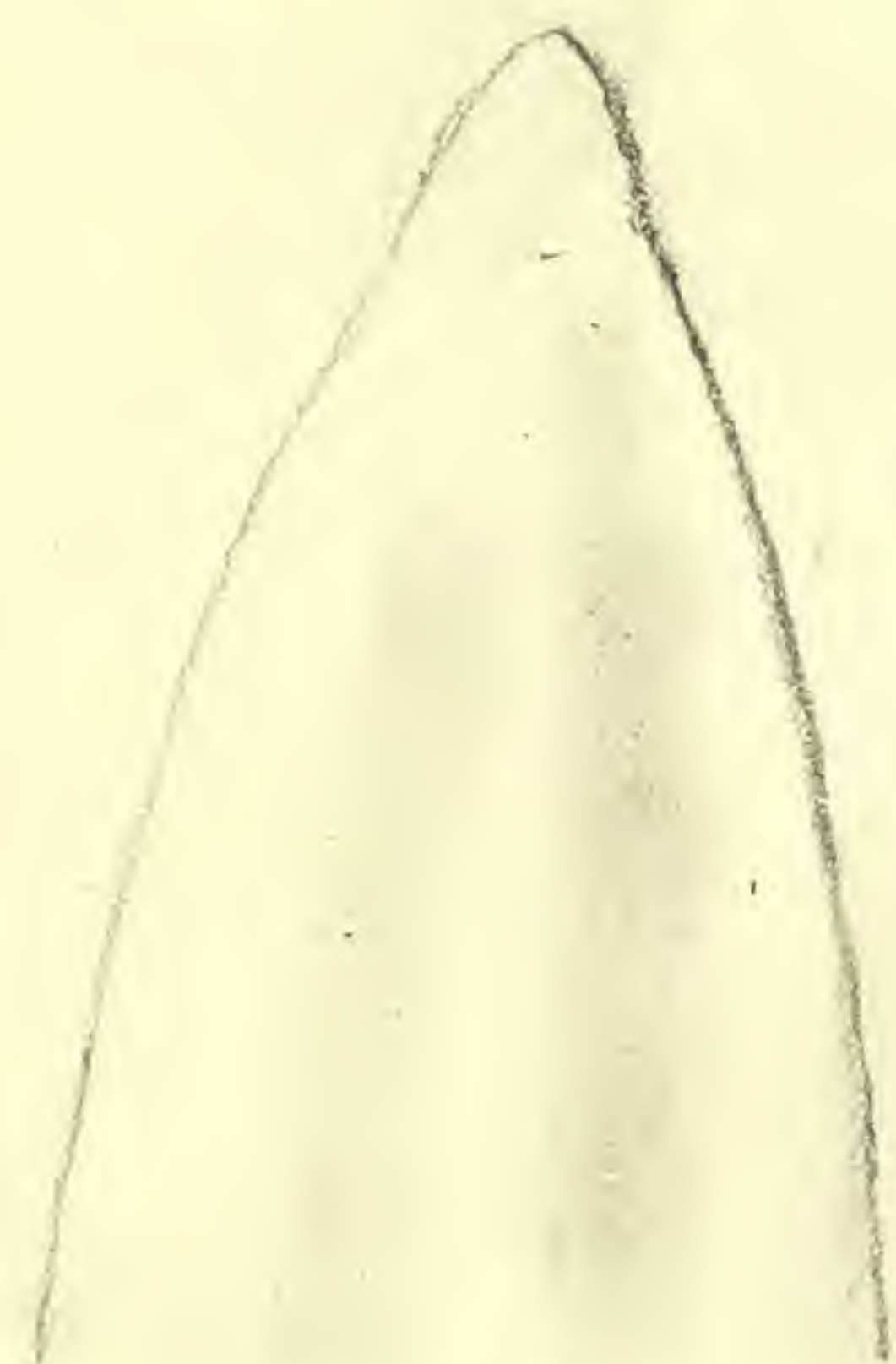
"*A. amabilis*" *A. Pandey*!
S. Watson Catal p. 233

April 9, 1872
 Oct 11, 1875
 from Walschley Mts

X 10

X 10

1869



sections of leaf
 near tip



in middle



near base



resin ducts
 proclaim this
Opuntia

covered with
 stomata

foliage of
 but very
 of occid.

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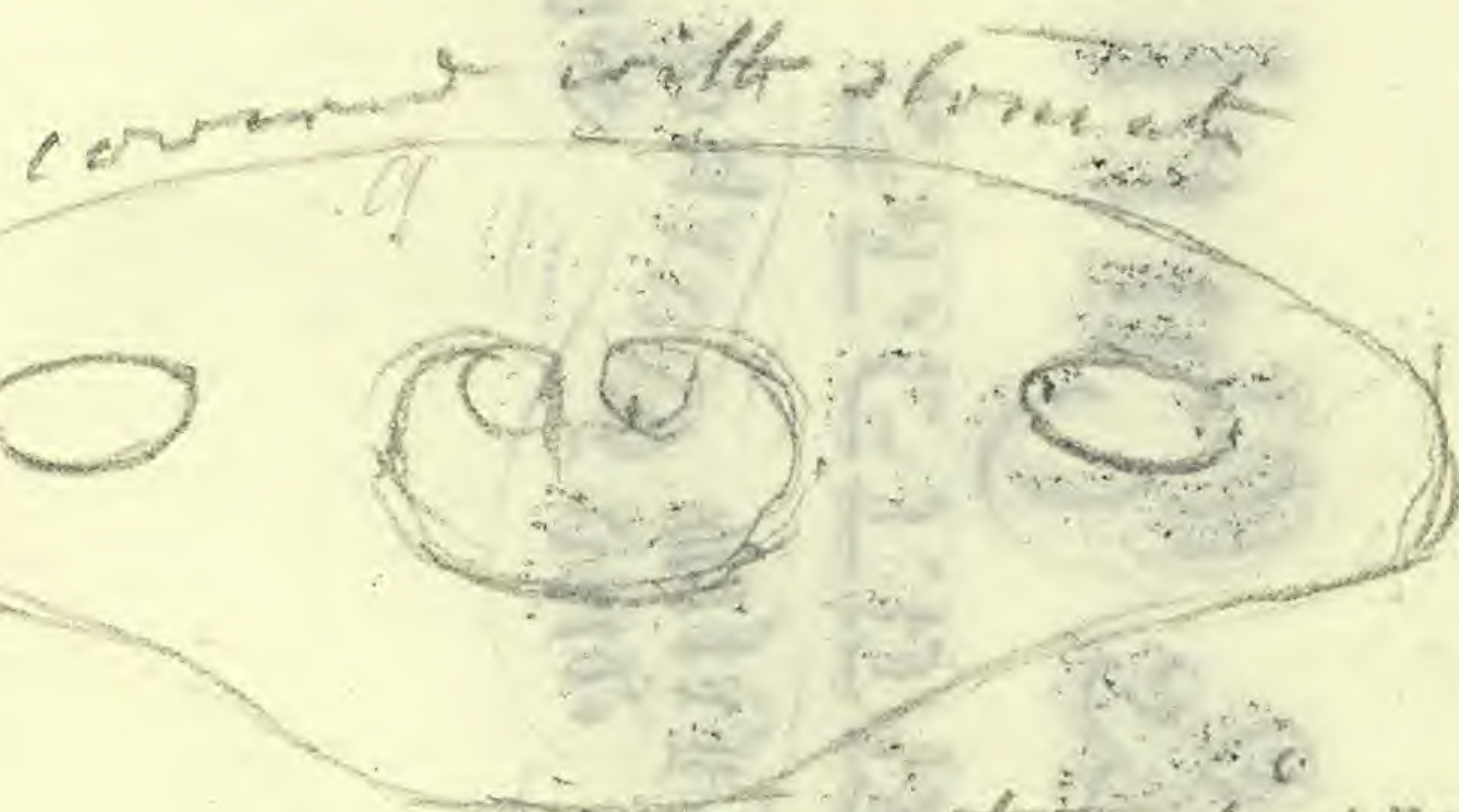
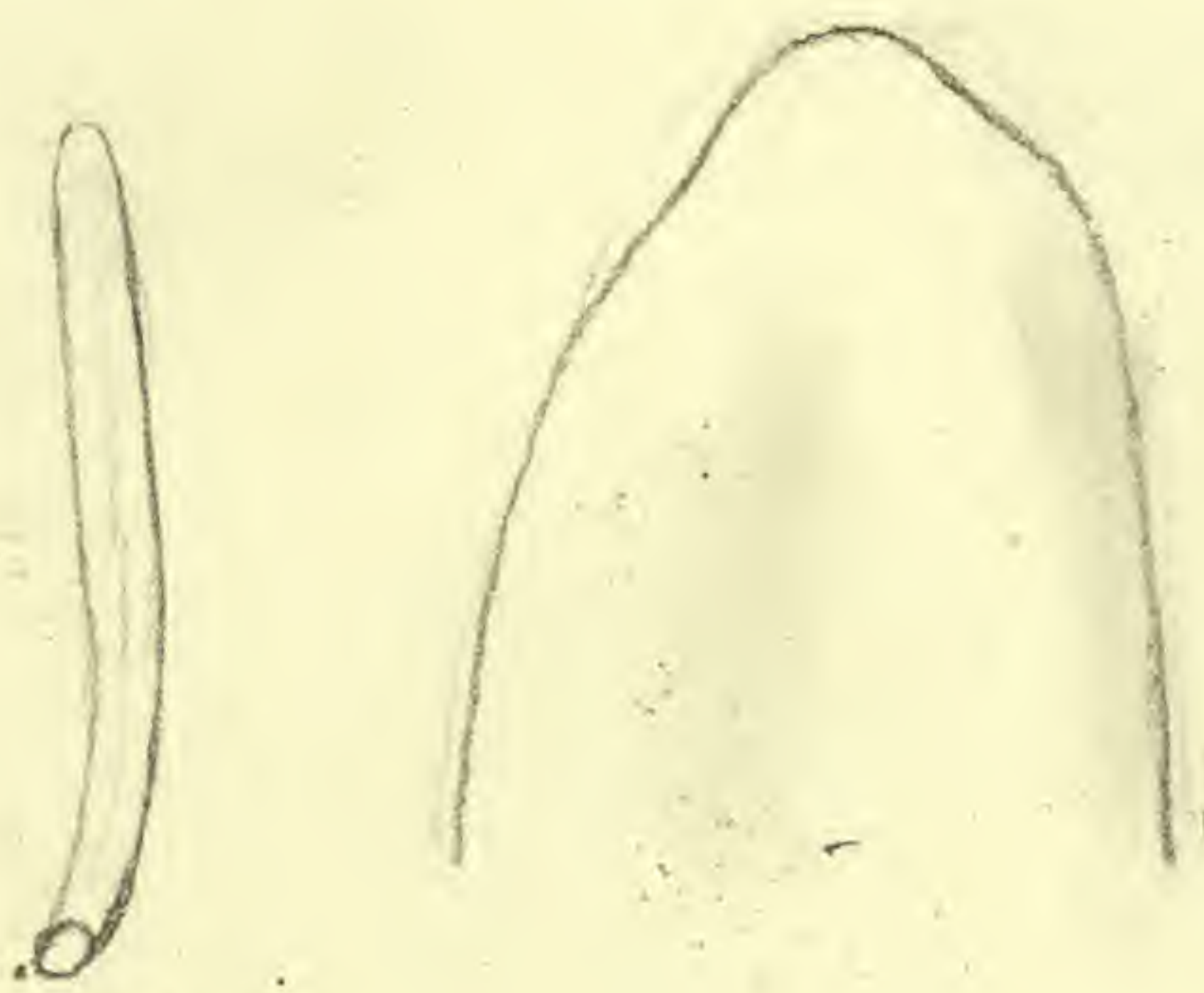
Abies grandis

April 15 1872

Fremont 1845 No. 211

stomata abundant on both sides
of leaf

x10



sect. of leaf
near top



x30

Oct 4 1875

middle



near base



hypoderm as in 202

amabilis, Watson
has similar large
latent ducts April 1872



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Abies grandis

Louisiana

April 15 1872

Fremont 1845 No. 202

stomata abundant on both sides

stomata abundant

$1\frac{3}{4}$ inch



x10



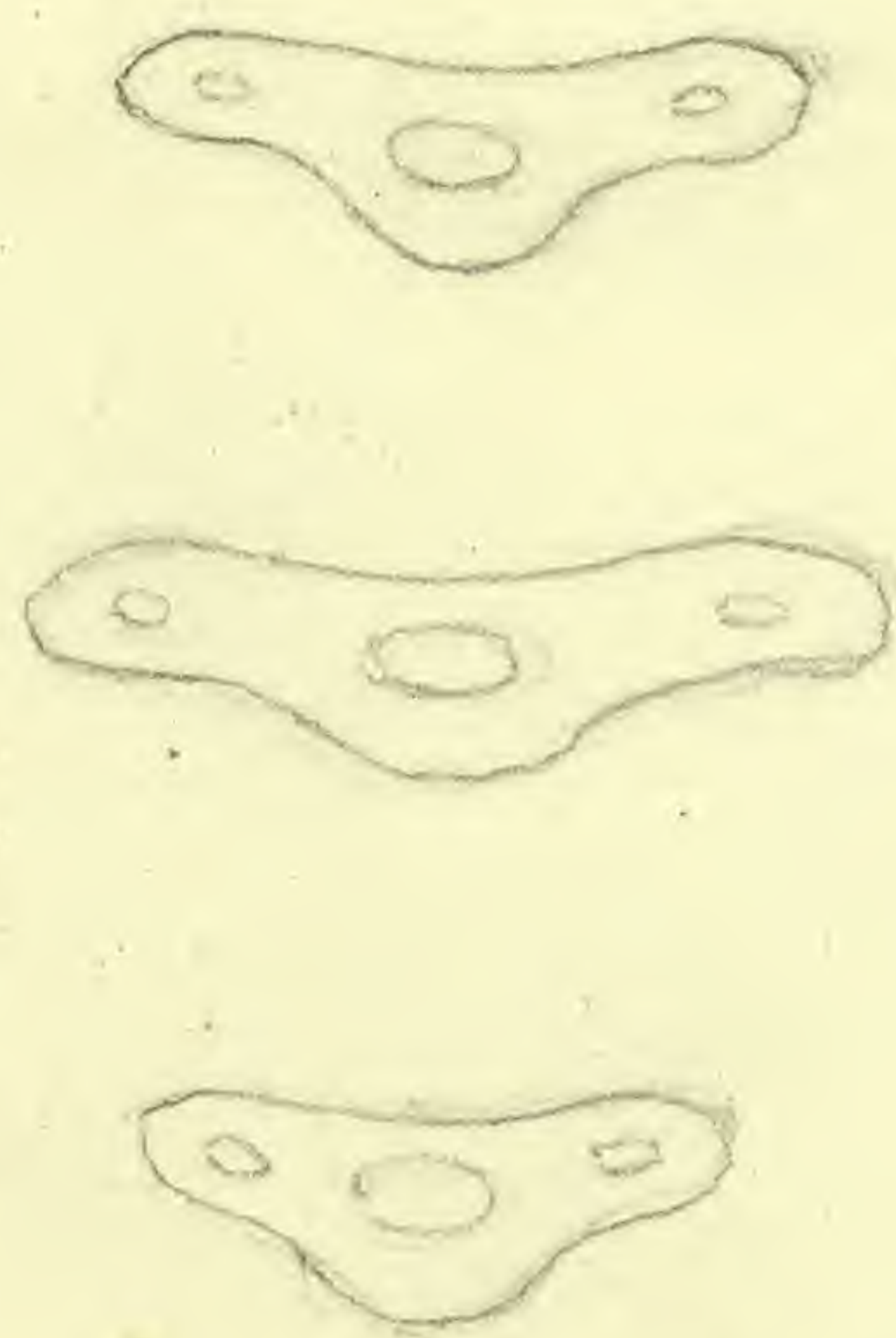
x10



x30

40th
1875

hypoderm cells
on edges a keel
small but many
none above



sect of leaf near tip

in middle

near base



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Abies lasiocarpa
stomatosa

July 19 1877

Birch Creek Canon

near Fairview, Utah

A. L. Siler

July 1877



long

leaves

on an

axis, which a

year before

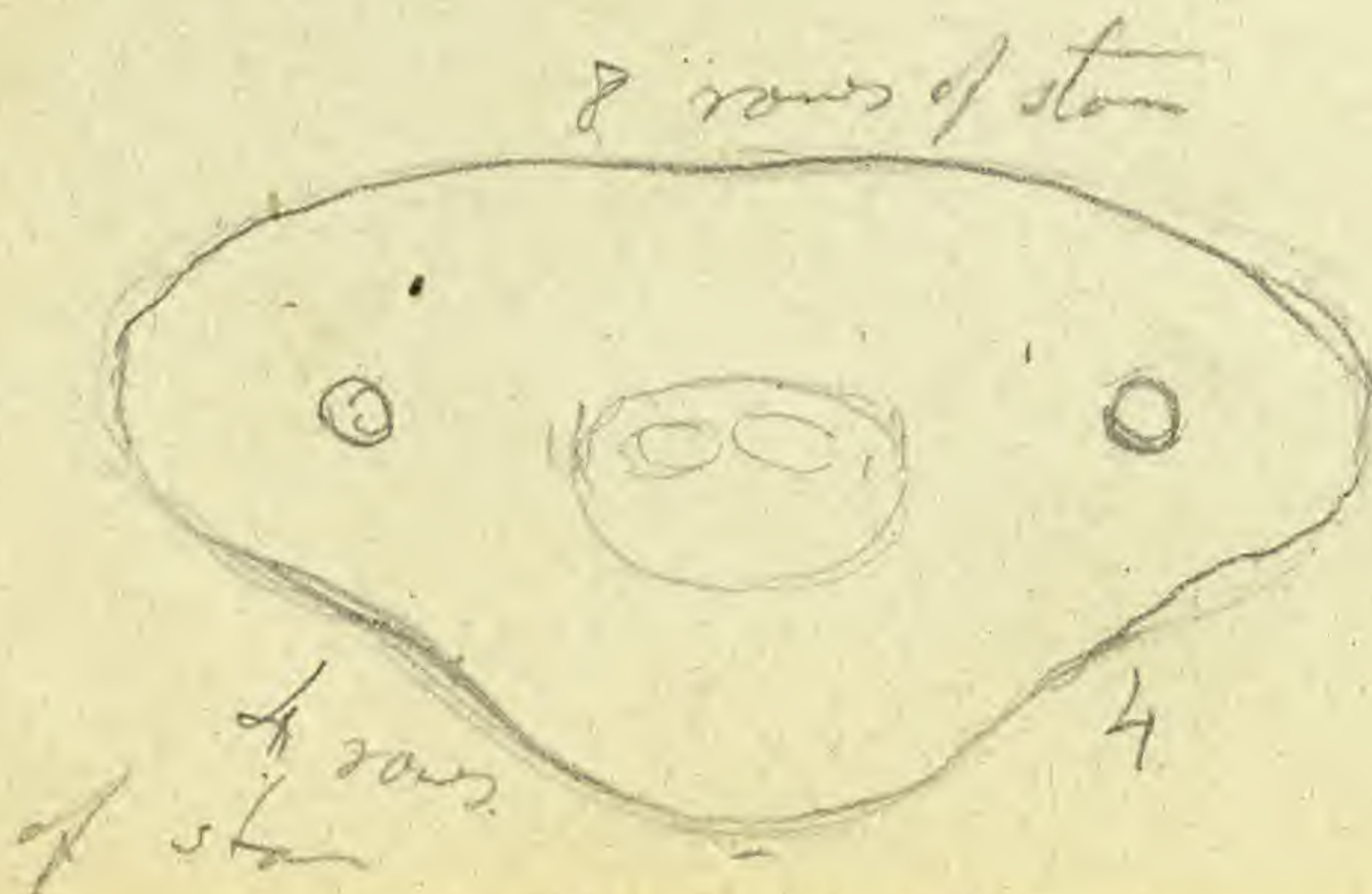
bore cones

1/2 inch

about 12 rows of sta



stout leaves on vigorous shoot
 which bears cones



latent shoot of same
 branch

purple bract & scale after
 flowering x4



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CHEMIST

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ALL THE NEW REMEDIES
CONSTANTLY ON HAND

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